Innovation in Europe: Where’s it going? How does it happen?

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Overview

- Innovation in Europe: Where is it going?
  - The challenge
  - The Lisbon Agenda, targets and progress
  - Framework programmes
  - Dealing with diversity

Innovation in Europe: How does it happen?

- Modelling the innovation value chain – knowledge sourced, transformed and exploited
Innovation in Europe – Where is it going?
The US – EU R&D Comparison
A source of concern?
The ‘Lisbon Agenda’

- In March 2000, EU heads met in Lisbon Summit and set goal to make the EU "the most competitive and dynamic knowledge-based economy in the world, capable of sustainable economic growth with more and better jobs and greater social cohesion".

- The Lisbon Summit was designed to mark a turning point for EU enterprise and innovation policy: it saw the high-level integration of social and economic policy with practical initiatives to strengthen the EU's research capacity, promote entrepreneurship and facilitate take-up of information society technologies.

- Key target – to raise investment in R&D to three per cent of GDP with objective of two-thirds of this coming from the private sector.

- Key initiative – development of a European Research Area – with intensified cooperation on R&D and innovation – draws strongly on ideas of 'open innovation' and innovation systems.
Total R&D as % of GDP
Business R&D (% of GDP)

OECD

- Finland
- Korea
- United States
- Denmark (2002)
- Iceland
- OECD
- France
- United Kingdom
- Norway
- Netherlands (2002)
- Georgia (2003)
- Czech Republic
- Italy (2002)
- Hungary
- Portugal (2002)
- Turkey (2002)
- Mexico (2001)

% of GDP

OECD

- Mexico (2001)
- Portugal (2002)
- Turkey (2002)
- Finland
- Korea
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- Norway
- Netherlands (2002)
- Georgia (2003)
- Czech Republic
- Italy (2002)
- Hungary
- Portugal (2002)
- Turkey (2002)
- Mexico (2001)
Higher Education R&D as % of GDP

- Sweden: 0.7
- Finland: 0.7
- Austria (2002): 0.6
- Denmark (2002): 0.6
- Norway: 0.6
- United States: 0.4
- Germany: 0.4
- EU15 (1): 0.4
- France: 0.4
- EU25: 0.4
- Georgia (2003): 0.4
- Portugal (2002): 0.3
- New Zealand: 0.3
- Hungary: 0.3
- Ireland (2002): 0.3
- Poland: 0.2
- Slovak Republic: 0.1
But little progress towards Lisbon target ..

- Recent figures show worrying trends in R&D investment and innovation in Europe. Not only will the Barcelona target of increasing R&D spending from 1.9 to 3 percent of GDP by 2010 be missed, but the R&D intensity has actually been declining since 2000. (As in the US, OECD, 2005).

- So what to do? Well increase public investment of course!

- Key EU measure is the Framework Programme (FP 7) covering 2007-2013 and €48bn investment.
Framework Programme 7

- FP7 is main EU measure to support cooperative R&D across Europe by supporting collaborative R&D projects, increasing researcher mobility and investing in large-scale capacity projects. Key mechanism is focussed calls for proposals and then competitive evaluation of project proposals.

- Four main areas of activity:
  - 1. Supporting collaborative R&D projects between universities, industry, research centres and public authorities
  - 2. The establishment of an autonomous European Research Council to support and stimulate basic research carried out by individual teams competing at European level.
  - 3. 'Marie Curie' actions, to strengthen training, the career prospects and mobility of European researchers.
  - 4. Capacities: refers to developing and fully exploiting the EU’s research capacities through large-scale research infrastructure, regional cooperation and innovating SMEs.

- Other supports for R&D and innovation – national measures and EU Structural Funds
### Measuring Innovation (% firms)

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<th>EU 1998-2000</th>
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<th>Georgia</th>
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<tr>
<td></td>
<td>All Firms</td>
<td>Industry</td>
<td>Services</td>
<td>Manuf, 2000</td>
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<tr>
<td>Total number of enterprises</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
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<tr>
<td>Product only innovators</td>
<td>10</td>
<td>10</td>
<td>11</td>
<td>23</td>
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<tr>
<td>Process only innovators</td>
<td>7</td>
<td>8</td>
<td>5</td>
<td>14</td>
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<tr>
<td>Product &amp; Process innovators</td>
<td>23</td>
<td>25</td>
<td>20</td>
<td>33</td>
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<tr>
<td>Enterprises without innovation activi</td>
<td>56</td>
<td>53</td>
<td>60</td>
<td>29</td>
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Note in the EU survey another category of incomplete innovation was allowed. This did not exist in the Georgia Survey.
Innovation in Europe: How does it happen?
Background remarks

- Focus on some research we are currently undertaking on panel data on the innovation activities of Irish firms over the 1999-2002 period

- Specifically, we are interested in using econometric modelling approaches to capture the process through which firms:
  - source the knowledge they need to undertake innovation
  - transform this knowledge into new products and processes, and then
  - exploit their innovations to generate added value.

- So we focus on three steps in the innovation process:
  - Step 1 - what factors shape the strategies firms adopt in sourcing the knowledge necessary for innovation? Are there complementarities here?
  - Step 2 - how do these alternative knowledge sources influence innovation outputs?
  - Step 3 - how do these innovations influence business growth and productivity?
Step 1: Knowledge Sourcing

- The aim here is to identify what determines firms’ engagement with different knowledge sources – think open innovation

- We argue that firms can either ‘make’ knowledge through R&D or gather it through links to customers, suppliers, other firms or public knowledge sources

- We find strong support for the idea that these knowledge sources are complementary. In other words $2 + 2 = 5$ in knowledge sourcing, perhaps suggesting economies of scope or learning effects

- Absorptive capacity effects – linked to R&D organisation – prove important in determining knowledge sourcing behaviour. Other aspects of firms’ resource base are less important.

- Policy factors also prove important – firms which received state support for innovation were more likely to develop new connectivity – possible behavioural additionality
The innovation value chain

Knowledge Production
Step 2: Knowledge transformation

- Now we are interested in the factors which shape the effectiveness of firms in translating knowledge into new products and processes

- R&D proves important here both in terms of increasing innovation directly as well as having an indirect benefit through enhanced absorptive capacity.

- External knowledge has a strong and positive effect on innovation outputs – but this differs in terms of product and process innovation

- Other factors are also important: plant vintage (-ve); multinationals (-ve); human resources (+ve); state support for innovation (+ve)
The innovation value chain
Step 3: Knowledge Exploitation

- Here we focus finally on the impact of innovation on business growth and productivity

- Innovation in product and processes are found to have a strong positive effect on growth

- Effects on productivity are more complex – process innovation has a positive effect on productivity but product innovation has a short-term negative effect

- Capital intensity also has a positive effect on as do skill levels

- Policy implications are straightforward encouraging innovation will lead to faster business growth, and this can be supported by training and measures to support capital investment.
The innovation value chain
Final Remarks

- Europe has made slow progress in increasing levels of R&D spending and innovation investment over recent years despite the policy emphasis.

- The Scandinavian countries tend to be setting the pace for R&D and innovation investments and a more conscious systemic approach to policy – considerable variation remains between countries and between ‘modes’ of innovation.

- Issues such as absorptive capacity and behavioural additionality are seen as important in terms of building lasting innovation capabilities.

- Our understanding of the complexity of the innovation value chain remains limited and will be a continued focus of research.